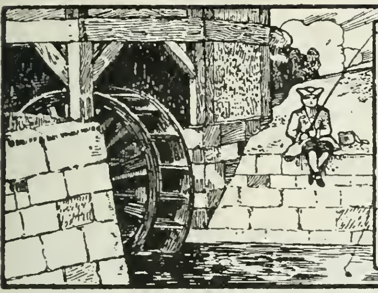


CONCRETE COTTAGE BUILDING.

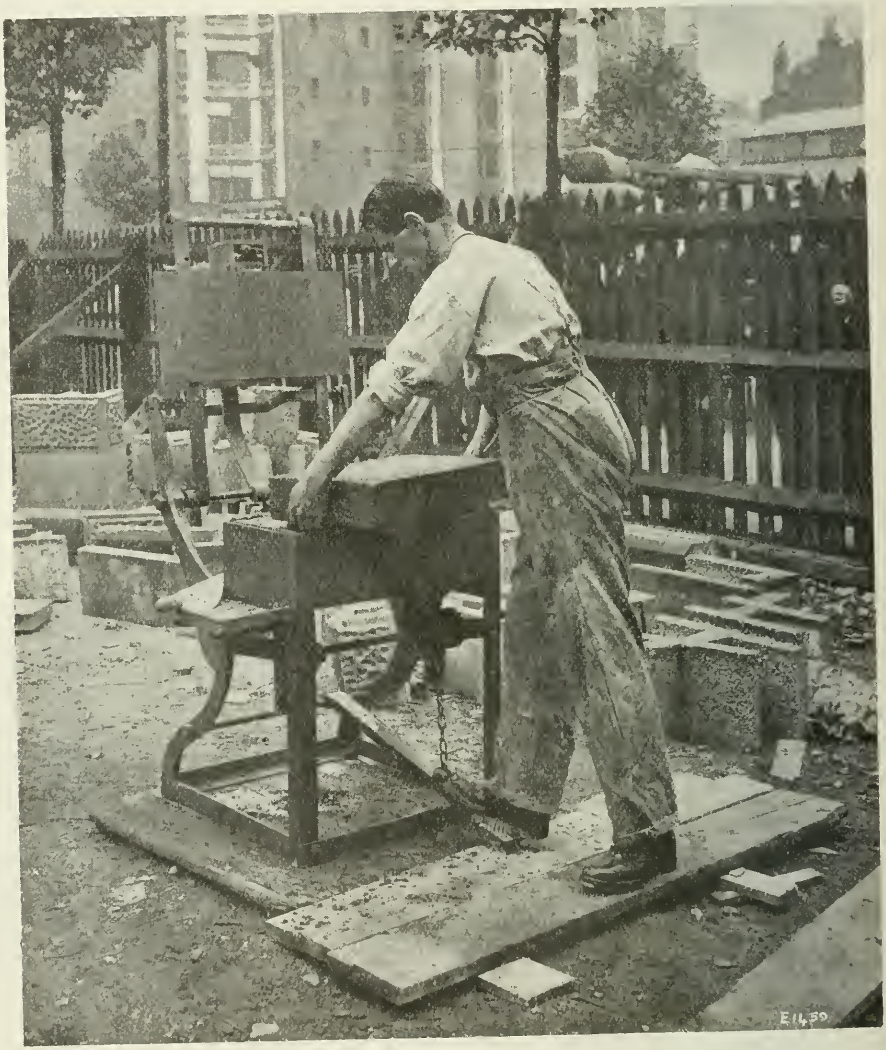
A SIMPLE BLOCK-MAKING MACHINE.

THE sudden development in the use of concrete as a cottage-building material has produced a diversity of systems, ranging from a portable machine, designed only for the manufacture of bricks or blocks requiring in their use no particular method of construction, to an intricate design in which the entire house is the unit produced. The disadvantage of the latter system is that, although it may tend towards standardisation and mass production, it does not permit of any variations to suit differences of taste or environment. One of the essential qualities for a successful system is adaptability. In most systems it is possible to trace some—perhaps unconscious—trend of thought which is responsible for their inception ; thus in the simplest block-making machine it is that bricks are scarce, yet they are the traditional building unit ; let us, therefore, make our concrete into brick form. This will account for one kind of machine. Another person, however, may argue that damp penetration in a house occurs to a large extent at the joints of the brick work ; let us, therefore, have larger units and fewer joints. Thus a machine for the production of larger blocks is invented.

The Australia Concrete Block Machine Syndicate, Ltd., makes a machine which moulds blocks 24 in. by 12 in., varying from 2 in. to 5 in. in thickness. The machine is very portable and light, weighing only 4 cwt. It is, furthermore, extremely simple both in operation and design, having no complicated mechanical parts which are liable to damage.

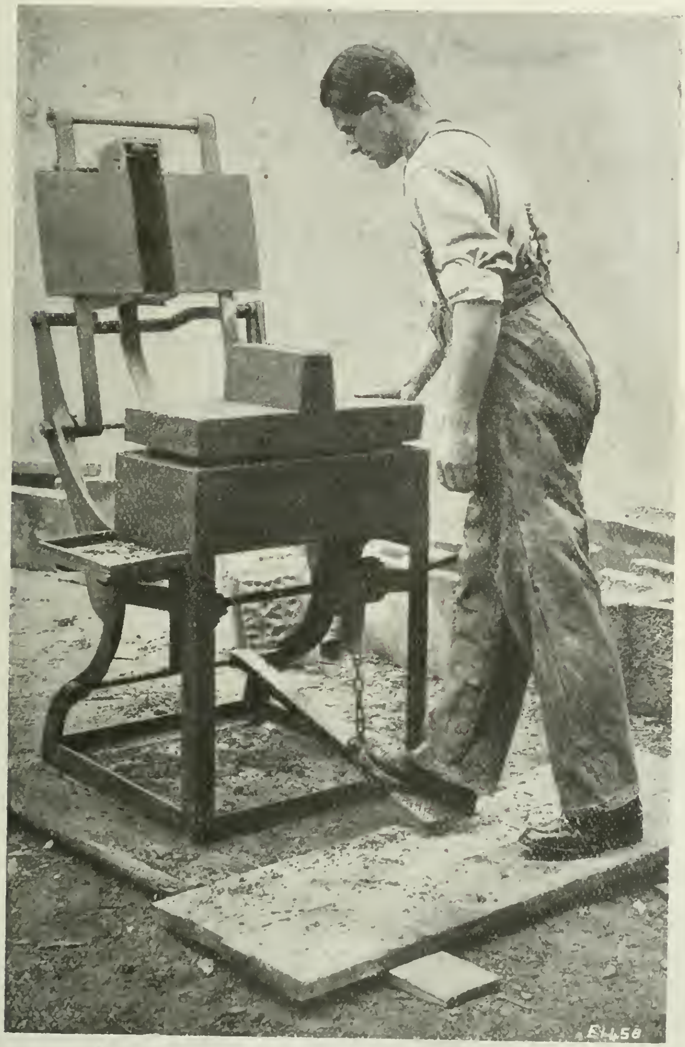
The blocks are moulded horizontally on pallets, thus they are made to the correct consistency, and no subsequent sprinkling—except in exceptionally hot weather—is required. The mixture is placed in the mould, at the bottom of which lies a pallet ; it is then rammed by an automatic hand-worked rammer. The block is lifted from the mould on the pallet by a simple device actuated by the foot of the operator, which consists of a false bottom double rack, two gear wheels, a pulley and chain, axle and foot lever. The gear wheels and pulley are attached to the axle, the chain being fastened around the pulley and to the foot lever. By pressing the foot lever downwards the chain unwinds and revolves the pulley and gear wheels on which the rack works, thus forcing the false bottom and block from the machine. The block is then set out on its pallet to dry for about twelve hours ; it is afterwards stood on end and the pallet released for re-use.

For the outside walls the blocks are T-shaped on plan, thus effecting a continuous yet well-bonded cavity, permitting of free circulation of air and requiring no metal ties. For partition walls an ordinary flat block is required, and by means of a simple adjustment to the hinged rammer these can be made from the same machine, as can also quoins, door and window jambs, mullions, and chimney flue blocks. By means of different pallets a variety of face effects can be obtained, such as chisel-dressed, hammer-dressed, vermiculated, tooled, pointed, with plain or drafted margins. Most of these, however, constitute an attempt to imitate stone work, and should therefore be eschewed by the careful designer. If concrete block-making is to take its place as a recognised building material it must do so without attempting to insinuate itself in the disguise of



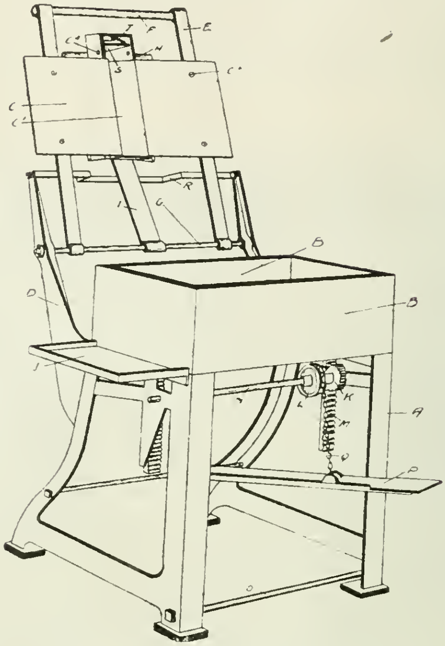
stone. And this, moreover, is by no means necessary, for concrete weathers into a variety of pleasant and characteristic surfaces and textures.

The method of making the blocks is extremely simple, although, of course, the greatest care must be exercised in choice of material and in mixing. For the plain block, the box is filled with concrete and the mechanical rammer brought down and raised. For the T-block the rammer is left down, and the flask mould



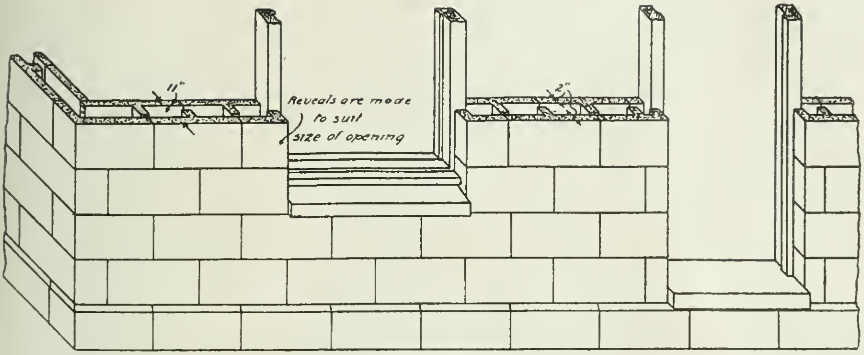
the centre of the rammer filled with concrete and rammed with a hand tamper nd finished off with the T-nib mechanical rammer. When the whole is ufficiently compressed both rammers are lifted off in one motion. The apparatus so designed as to afford particular protection to the corners and arrises, which therwise are liable to break away.

A—Legs.
B—Moulding Box.
C—Rammer Plate and T Section Mould combined.
D—Rammer Axle Stays.
E—Rammer Arms.
F—Rammer Handle.
G—Rammer Axle.
H—"T" Section Rammer Handle.
I—"T" Section Rammer Arm.



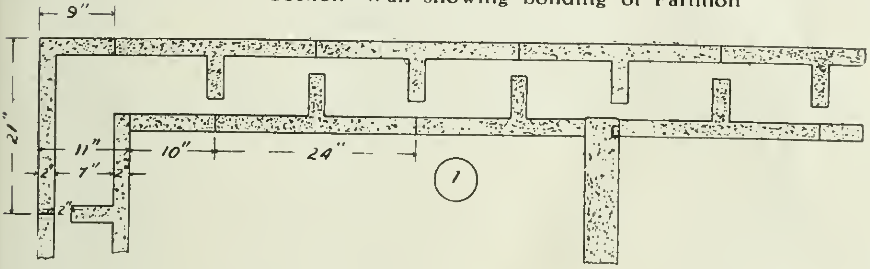
J—Shelf.
K—Cog Wheel.
L—Pulley.
M—Rack.
N—Main Axle.
O—Stay Bolt.
P—Foot Lever.
Q—Chain.
R—Rammer Support.
S—"T" Section Moulding Box Door.
T—Catch for closing door.

General View of the Australia Machine.



(Isometric) Showing Continuous Cavity Wall Bond

Plan of T Section Wall showing bonding of Partition



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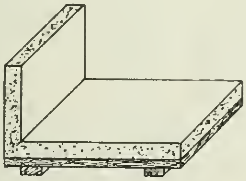
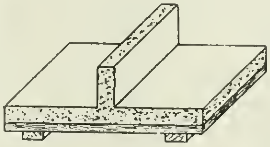
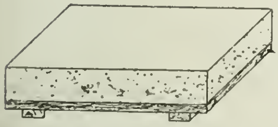


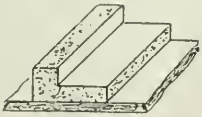
② Quoin on Pallet



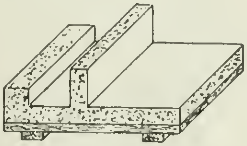
③ T Section Block on Pallet



④ Slab on Pallet



⑤ Half-door or Window Reveal on Pallet



⑥ Door or Window Reveal on Pallet.

Although with this machine it is possible to make blocks of special sizes by packing out the mould with wood, it is advisable to work to block dimensions. The walls should, therefore, be plotted out on paper before building, showing the exact position of door and window openings and any other special blocks.

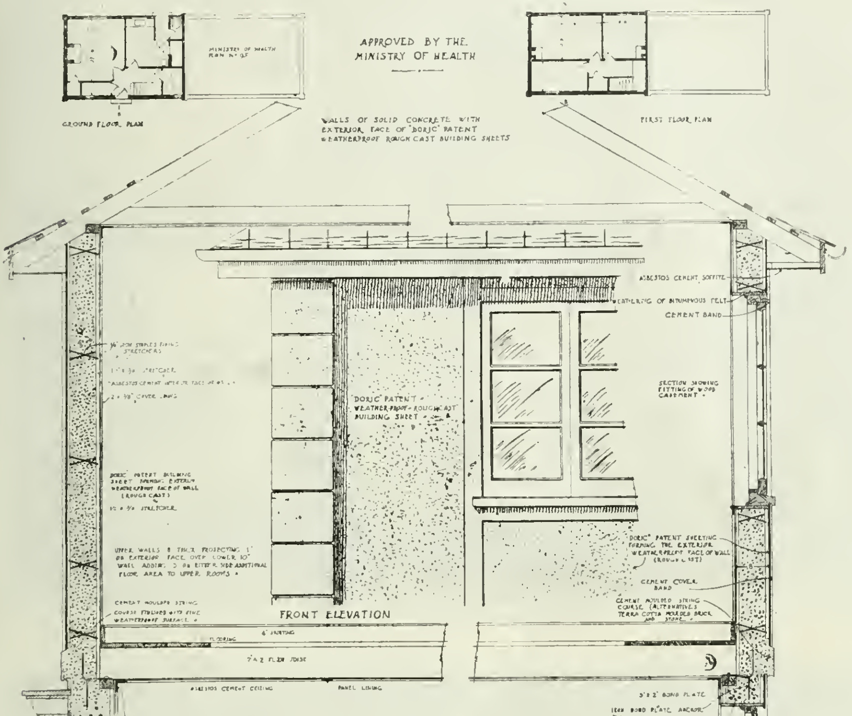
In the matter of cost, provided that suitable aggregate is at hand—and a variety of materials may be used for this purpose, such as ballast, gravel, scoria, crushed stones or granite—the blocks compare very favourably with brickwork. The cost of making 100 of the T-section blocks is stated to be 30s., and these are equivalent to 1,068 bricks. Partition slabs or breeze-blocks of a similar size are 25s. per 100. This, it need hardly be pointed out, is a great saving over brickwork, since London stocks cost more than 80s. per 1,000. A further saving occurs by reason of the fewer joints, which require only one-eighth the amount of mortar. The rate of daily output is estimated on one machine to be 350 faced blocks, or 450 breeze slabs. With regard to the speed of erection, it is difficult to give any very precise figure on account of the great discrepancy at present prevailing between potential and actual output. It is claimed that the blocks can be laid at a rate of 200 a day, and reckoning 100 blocks equivalent to 1,068 bricks, this would mean that blocks equalling about 2,136 bricks could be laid in a day. The output of the bricklayer is at present about 350 bricks.

Considerable success has been achieved in Australia by means of this machine, and its simplicity and adaptability should commend it to all who are dismayed at the present high price of bricks. It may be added that the only expensive item in connection with the machine, which costs £50, is the cast-iron pallets, but for those who are content with a simple plain-faced block this need be no deterrent, for wooden pallets—preferably of red pine—may be used for rough blocks, and for facing blocks a piece of flat tin placed on the wooden pallet is all that is required. Such pallets cost only one-tenth of those made of cast-iron. The surface of the outer wall may, if desired, be treated in a variety of ways, The machine is both simple and straightforward, free from unnecessary intricacies and embellishments, yet designed on scientific principles.

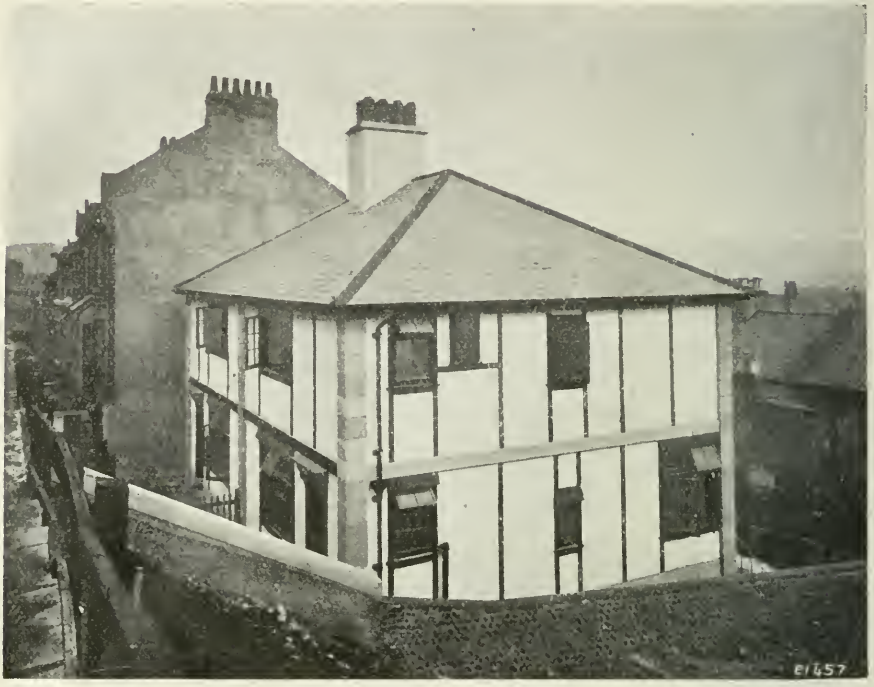
CONCRETE HOUSES AT BRIGHTON.

It is both natural and desirable that the intending builder of a house, whether he be an architect, a building contractor, or a layman, hesitates before recommending or employing a new method of construction unless he has had ample opportunity to examine it, not only on paper, but projected into three dimensions. Before long almost every district in England will possess concrete houses of some kind to which those proposing to build, in whatsoever capacity, may refer. It is as yet impossible to pronounce a verdict in favour of any one particular system of construction ; theories and opinions are conflicting, and perfection, even if it were obtainable, would necessarily sometimes give way to expediency. Again, many systems depend for their efficiency upon some patent ingredient which time alone can test. Such a system is that known as the " Doric," which is the patent. of the " Modern Building " Company, who erected some small houses in Kingsley Road, Brighton, in September, 1919.

The form of the " Doric " construction is that of a monolithic reinforced concrete wall. The principle is that of concrete piers at intervals, between which is placed shuttering that forms an integral part of the structure. The piers, which are built at salient and re-entrant angles and at other intervals according to the design of the building, are made of hollow pre-moulded concrete blocks, and are specially keyed to take the shuttering and to make bond with internal partitions. They are subsequently filled with cement. The outside plane of the


APPROVED BY THE MINISTRY OF HEALTH
MINISTRY OF HEALTH PLAN No. 95
GROUND FLOOR PLAN
FIRST FLOOR PLAN
WALLS OF SOLID CONCRETE WITH EXTERIOR FACE OF "DORIC" PATENT WEATHERPROOF ROUGH CAST BUILDING SHEETS
ASBESTOS CEMENT SOFFITE
WEATHERING OF BITUMINOUS FELT
CEMENT BAND
SECTION SHOWING FITTING OF WOOD CASEMENT
"DORIC" PATENT WEATHERPROOF ROUGHCAST BUILDING SHEET
"DORIC" PATENT BUILDING SHEET FORMING EXTERIOR WEATHERPROOF FACE OF WALL (ROUGH CAST)
UPPER WALLS 8" THICK PROJECTING 1" ON EXTERIOR FACE OVER LOWER 10" WALL ADDING 3" ON EITHER SIDE ADDITIONAL FLOOR AREA TO UPPER ROOMS
CEMENT MOULDED STRING COURSE FINISHED WITH FINE WEATHERPROOF SURFACE
"DORIC" PATENT SHEETING FORMING THE EXTERIOR WEATHERPROOF FACE OF WALL (ROUGH CAST)
CEMENT COVER BAND
CEMENT MOULDED STRING COURSE (ALTERNATIVES TERRA COTTA MOULDED BRICK AND STONE)
FRONT ELEVATION
FLOORING
7" x 2" FLOOR JOIST
ASBESTOS CEMENT CEILING
PANEL LINING
3" x 2" BOND PLATE
IRON BOND PLATE ANCHOR TIES
2½" x ⅜" COVER LINING
CEMENT COVER BAND
10" STRETCHER
"DORIC" CONCRETE PIER KEY BLOCK (CORNER)
"DORIC" CONCRETE PIER KEY BLOCK (INTERMEDIATE) WITH CEMENT WEATHERPROOF FACE
SECTION SHOWING FITTING OF METAL CASEMENT
"DORIC" PATENT BUILDING SHEET FORMING THE EXTERIOR WEATHERPROOF FACE OF WALL (ROUGH CAST)
CEMENT CONCRETE
ASBESTOS CEMENT INTERIOR FACE OF WALL
IRON BONDING TIES
PARTITION WALL
"DORIC" PATENT BUILDING SHEET FORMING THE EXTERIOR WEATHERPROOF FACE OF WALL (ROUGHCAST)
INTERMEDIATE PIER
PLAN SECTION THRO 10" WALL SHOWING JUNCTION WITH PARTITION WALL
COMPOSITION FLOORING
SCALE 1" = 1 FOOT
VERTICAL D.C. BOND, PATENT SHEETING
DAMP COURSE "DORIC" PATENT SHEETING AS REQUIRED BY LOCAL AUTHORITY
FOUNDATIONS CEMENT CONCRETE ACCORDING TO REQUIREMENTS OF SITE
SECTION THRO' A.B.

Details of construction, Doric System.



Exterior view of completed house.

Living room.
HOUSES AT BRIGHTON ON THE DORIC SYSTEM.

wall is made of patent building sheets which are manufactured by a special process of cement and asbestos fibre, reinforced with netting and weather-proofed with a bituminous composition which is claimed to be impervious. Another form of patent sheeting forms the inside plane to the wall. These sheets are held in position by wooden stretchers, connected through the thickness of the wall by iron ties. These ties are left in the wall as reinforcement. The concrete is poured into the cavity between the sheets. At intervals iron ties are built into the piers ; these bond with the liquid concrete.

At first-floor level the wall is reduced in thickness and it is overhung, and the wall plate is layed on the space thus formed. To the floor joists are attached iron bars bent upwards and downwards so as to anchor into the wall. Thus where these run across the building they act as ties, and tend to stiffen the whole structure. The construction of the upper part of the wall is continued in the same way above the first floor, but reduced in thickness from 10 in. to 8 in. in the case of the houses at Brighton. A cement-moulded string course is formed where the upper part of the wall projects ; it should be possible, however, to carry the wall up without this overhang, which, if it constituted an essential part of the structure, would necessarily impose a very severe limitation upon the designer of the house. Similarly, the joints in the patent sheeting are covered by a vertical cement fillet ; if this were unavoidable it would constitute a great disadvantage. But there seems no reason why the joints should not be well lapped and the whole wall treated with rough-cast or cement. In the same way the joints of the inside sheeting, which occur over the wood stretchers, are covered by wood strips, thus dividing the wall surface into panels. This treatment might not always be desired ; the alternative would then be to paper the walls. The wood stretchers occurring at regular intervals form permanent fixings in place of plugs or coke-breeze.

The accommodation in the houses at Brighton is that of the Ministry of Health's " B " type, viz., a parlour, living room, scullery and larder on the ground floor, with three bedrooms, a bath and w.c. on the first floor. If the houses prove successful, and this depends for the most part upon the impervious quality of the outside sheetings, there is no reason why the system should not be adapted to larger houses. The cost of the cottages, assuming a level site, would be approximately £700, which shows a considerable saving over a similar-sized house constructed in brickwork. The houses have been approved by the Ministry of Health in connection with State-aided housing schemes, upon which the Government grant loans over the full period of 60 years.

The erection of these houses is an interesting and enterprising experiment, and only by continuing such experiments will concrete take its rightful place as a recognised material for cottage building, and a foolish wish, such as the one recently expressed in a contemporary, that concrete houses may soon crumble to the dust from which they were made, as if bricks were not equally composed of that ubiquitous material, be a thing of the past.